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ULCERATION. DEATH FROM HEMORRHAGE.

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RUPTURE. DEATH.

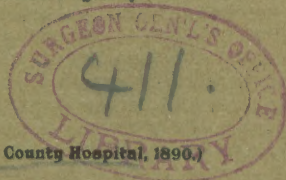
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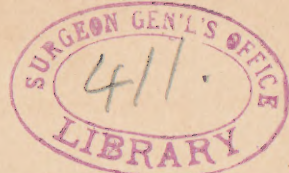
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CARCINOMA OF OESOPHAGUS. SECONDARY IMPLANTATION.
CARCINOMA IN STOMACH. ULCERATION. DEATH FROM
HEMORRHAGE.

A man, aged about sixty, was admitted to the Cook County Hospital in February, 1890, complaining of intense abdominal pain and vomiting, death taking place suddenly before any clinical details were obtained.

Post-mortem examination forty-eight hours after death. The body was greatly emaciated, and the skin was very white. The pericardium was empty; the heart was of normal size, but soft and flabby; the cardiac muscle was of a pale gray color with here and there yellow, butter-colored streaks; the semilunar valves were competent.

In the left pleural cavity were some firm bands of adhesions; the lungs floated and crepitated; on the cut surface they were light red in color.

The abdominal cavity was empty and free from adhesions, except about the vermiform appendix, which was bound down by cicatricial bands. The spleen measured 11.5x7.5x2 centimetres; the capsule was wrinkled; section showed a pyramidal-shaped area of light yellow color, the base of which corresponded to the surface of the organ and measured 3.5 centimetres in its greatest diameter, the height of the pyramid being 4 centimetres. No plugged vessel could be demonstrated.

The kidneys were about normal in size, the capsules were free, the cortex sustained the relation to the medullary portion of 1 to 3, the cut surfaces being rather light red in color. The liver and the gall bladder showed nothing abnormal.

The stomach was full of dark clots and fluid blood, and examination for the source of the hemorrhage commenced above with the pharynx and extended downward. On the posterior wall of the oesophagus, 6 centimetres below the bifurcation of the trachea, was an oval, slightly raised area, measuring 3x1.5 centimetres, the mucous surface of this nodule being rough, presenting small ulcerations, and grayish-white in color, on the cut surface the tissue was quite firm and white. The rest of the oesophageal lining was smooth and light red in color. In the posterior wall of the stomach was a circular opening 4 centimetres in diameter, the

upper margin of this opening involved the lowest part of the œsophageal mucous membrane, the remainder the gastric. A little to the left of this opening is a smaller, perfectly round perforation, with distinctly terraced margins, *i. e.*, the loss of substance was greatest in mucous coat, less in the muscular, and least in the serous; the margins of the larger opening were rather smooth, but very much thickened. Both these perforations passed into a cavity behind the cardiac end of the stomach as large as a hen's egg, with very irregular walls, covered with a grayish viscid material, the cavity itself being filled with blood. At the bottom of the cavity a small opening was seen passing directly into a vessel—an artery of fair size, as large as a goose-quill. The efforts to locate this vessel anatomically were unsuccessful, but it was thought to be the splenic.

The mucous membrane of the stomach was otherwise soft and grayish. The small intestine also contained blood, but seemed unchanged in its structure. The brain and its membranes were apparently normal.

Microscopical examination of the nodule in the œsophagus, and of the walls of the large ulcers in the stomach, showed the tissue to be infiltrated with masses and columns of large, flat cells with large nuclei; these cells were arranged in larger and smaller connective tissue alveoli, or spaces of irregular size, and there was no connection between the cells and the stroma. In the œsophagus the infiltration of flat cells extends into the muscular coat. The tissue composing the margins of the large ulcer in the stomach shows this sort of structure throughout all the layers in the œsophageal as in the gastric portions of the ulcer, the connective tissue was here rather densely infiltrated with small cells. In the margins of the smaller terraced ulcer no flat cells were found.

Diagnosis. Carcinoma of œsophagus; carcinomatous ulceration at junction of stomach and œsophagus; simple or perforating ulcer of stomach; hemorrhage from splenic artery; simple splenic infarct; perityphlitic adhesions.

Remarks. Usually the œsophagus contains but one carcinomatous focus, as a result of regional infection the primary growth is often surrounded by many smaller nodules. Where two entirely distinct tumors are found, they might be considered as having

each an independent origin, or one as having arisen by metastasis from the other. In over half of the cases carcinomatous lymphatic glands are found in the vicinity of the primary tumor. Metastatic diffusion through the blood vessels is not so frequently observed, though in cases of carcinoma of the lower half of the œsophagus metastatic tumors may occur in large number, particularly in the liver, less often in the lungs, and in other organs.¹

As far as known the lymphatics of the stomach and of the œsophagus have no such connection as would allow direct transportation of cells or other material from one of these organs to the other, and the circulatory apparatus of the two organs is also quite separate and distinct, at any rate in case the focus in the œsophagus was secondary to the one in the stomach, or *vice versa* as the result of the systemic infection of the blood, it would be reasonable to expect a more general diffusion of tumor masses than was found in this case. The presence of these two carcinomatous foci in the upper portions of the same digestive tract under circumstances that exclude the possibility of one focus being secondary to the other, as the result of blood or lymph dissemination, makes this case one of rather unusual interest.

The two foci must either have an independent, primary origin, or one must be secondary to the other. Lymphatic and vascular diffusion as well as growth by continuity being out of question; the only remaining explanation of a secondary origin for one of these growths is that of implantation on the mucous membrane of the carcinomatous cells torn loose from the ulcerated surface of the upper nodule, let us say, and carried down the lumen of the œsophagus. The involvement in the carcinomatous ulcer in the stomach of part of the lower end of the œsophagus leaves no such absolutely certain anatomical evidence of its secondary origin as would be the case if it had been situated entirely in the stomach, where its squamous-celled structure would at once establish it as secondary to some primary squamous-celled carcinoma in some other organ in this case, and ulcerated nodule in the gullet. Involving, as it did, part of the œsophagus, it might have had a primary origin in the mucous membrane of the œsophagus simultaneously with the nodule higher up. Assuming, however, that the destructive ulcera-

¹ Orth, Path. Anat., Berlin, 1887, Band 1, p. 686.

tion proceeded with the same rapidity and to the same extent on all sides from the central and oldest portion of the growth, then we would have to conclude that the lower end of the œsophagus became involved in the course of the ulceration by continuity of tissue, and consequently the carcinoma of the stomach did originate from implantation of carcinomatous cells from the ulcerated nodule in the gullet upon the gastric mucous membrane near the cardiac orifice. And this seems to me to be the most reasonable conclusion, because it accords well with the anatomical findings in the case, as well as with the published observations bearing upon the development of secondary carcinoma through implantation upon or in mucous surfaces. There are quite a number of cases in the literature illustrating carcinomatous metastasis by means of engraftment of loose particles upon various mucous, as well as serous surfaces.

Thus, in the peritoneal cavity, implantation carcinoma, in the excavations in the pelvis are quite frequent in cases of carcinoma of the stomach, subsequent to the involvement of the peritoneum, due, it is thought, to the falling of loose cells or particles from the growths in the peritoneal layers about the stomach. Orth² describes a case of implantation on the peritoneal coat of the stomach, in the pyloric end of which was a cylindrical-celled carcinoma, while on the serous surface was a colloid nodule as large as a walnut, which he could not regard as arising in any other way than by implantation from a colloid carcinoma of the cæcum. Erbse³ describes a case of carcinoma of the smaller bronchi and of the alveoli of the lung, due to implantation of carcinomatous particles following the perforation of an epithelioma of the œsophagus into the trachea and Moxon⁴ narrates a similar occurrence. But the most frequent seat of implantation carcinoma on a mucous surface, at any rate, seems to be the stomach in cases of carcinoma of the œsophagus; of fourteen cases of metastatic carcinoma of the stomach collected in the literature by Ely,⁵ five were plainly due to implantation of particles from ulcerated tumors in the œsophagus, the other nine being the result of systematic dissemination through the

² Loc. Cit., p. 733.

³ Erbse, Inaugural Dissertation, Halle, 1884.

⁴ Moxon, Trans. Pathol. Soc., London, XX., p. 28.

⁵ Ely, Amer. J. Med. Sci., June, 1890.

blood, often from primary tumors remotely situated from the stomach.

Grawitz⁶ reported two cases of ulcerated carcinoma in the œsophagus, in one of which there was an ulcerating tumor in the stomach and a smaller one near the lesser curvature; in this case there was also, as in my own case, a simple gastric ulcer present; in the second case there was a large carcinomatous mass near the cardiac orifice, and also a small tumor on the liver. Haven Norman⁷ found a metastasis as large as a pea near the cardiac orifice in a case of carcinoma of the œsophagus, and Beck⁸ and Zahn⁹ have each described a case similar in their details to those of Grawitz. From microscopical appearances Beck concluded that squamous cells from the œsophagus lodged in the gastric glands and thence gave rise to secondary tumors. Add to these five cases three cases described by Klebs,¹⁰ which seem to have escaped Ely's notice, and the case mentioned in this paper, and we find that the majority of metastatic carcinomas of the stomach are due to the engraftment of particles from primary tumors situated higher up in the digestive tract.

Successful inoculations of carcinomatous material in animals have recently been done¹¹ and it was quite reasonable to expect as much, since the possibility of implantation of carcinomatous particles on mucous and on serous surfaces and the subsequent development of secondary tumors is admitted and recognized on all sides, though the predisposing conditions that must necessarily be present always in the individual animal, or human being, will remain practically unknown until we learn a vast deal more of the nature and cause of the growth of carcinoma.

RUPTURE OF PORTAL VEIN FROM A FALL. DEATH.

A man whose identity could not be accurately established, but who had been indulging in a protracted debauch, was found dead in his room, September 8, 1888. At the Coroner's inquest wit-

⁶ Grawitz, Virchow's Archiv., LXXXVI., 1881, p. 159.

⁷ Review in Virchow & Hirsch Jahresbericht, 1882, i. 286.

⁸ Beck, Prager Zeitschr. f. Heilkunde, 1884, No. 6.

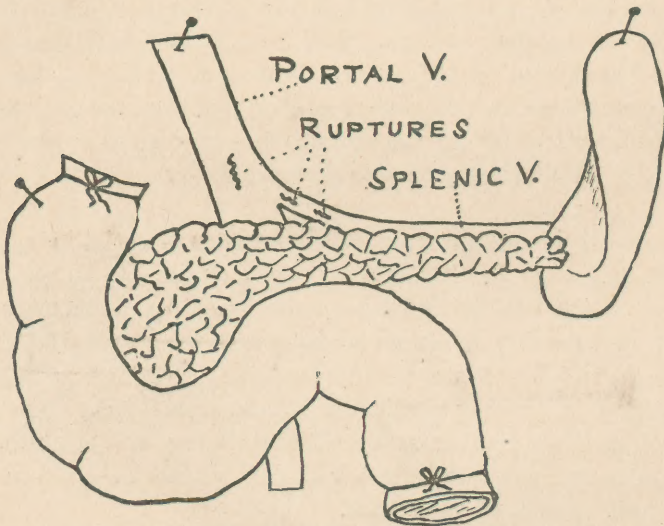
⁹ Zahn, Virchow's Archiv. CXVII., 1889, 30.

¹⁰ Klebs, Handb. 1, 190, 1869.

¹¹ Hahn, Berlin Klin. Wochen., s. 1888, 413.

nesses testified that about two hours before his body was discovered, he was seen standing on the sidewalk, leaning with his back against the balustrade, enclosing the stairway, that descended from the street into the basement; he was seen to suddenly fall directly backward over the balustrade down to the bottom of the stairs, a distance of about ten feet. He slowly picked himself up, staggered up-stairs and into his room where he was found dead two hours later.

The *post-mortem* examination in the Cook County Hospital morgue, after twenty-four hours, showed him to be five feet two inches tall, about thirty-five years old, and rigor mortis well marked. The skin all over the body was found intact; there was a small



SHOWING LOCATIONS OF RUPTURES.

area of hemorrhagic extravasation underneath the scalp above the right ear; there was a whitish, viscid fluid in the meatus urethrae, and there were numerous blue specks in the skin covering the forehead.

The abdominal cavity contained about three litres of fluid blood; beneath the liver and behind the stomach quite firm clots were found. Thorough search for the source of the blood showed an opening about four mm. long into the portal vein, commencing on its anterior wall, immediately above its formation by the junction

of the superior mesenteric and splenic veins and near the upper border of the head of the pancreas; fluid blood oozed out of this rent, the long axis of which corresponded to that of the vein; the margins of this opening were quite smooth and clean cut; there were no microscopical abnormalities in the portal vein in any part of its course and it seemed normal about this opening. There were two smaller rents in the splenic vein near its coalescence, with the superior mesenteric, and this vein also seemed normal. There were no evidences of any cicatricial dislocation or contraction of any of the structures in the vicinity.

The liver was pale, but of usual size; the biliary passages were patent; the spleen and the kidneys seemed quite normal. The stomach showed diffuse red areas in its mucous membrane. The Peyer's patches, just above the ileo-cæcal valve, were pigmented. The heart was empty, firm, and showed no gross, morbid changes except a chronic thickening of the aortic semilunar valves; the lungs and the pleuræ, the brain and its membranes were quite healthy.

Microscopical examination of portions of the portal and splenic veins at the site of the ruptures as well as elsewhere, showed only normal vein structure.

LOOSE BODIES IN THE PERITONEAL CAVITY.

During the course of two recent *post-mortem* examinations the following unusual appearances were found in the upper surface of the right lobe of the liver; on removal of the liver and inspection of the external surface a circular body was found in each case, in a depression in the summit of the diaphragmatic surface of the right lobe. One of these bodies was perfectly round, measuring 1.5 cm. in diameter and 3 millimeters in thickness. Its external surface was perfectly smooth, grayish in color; the consistence was quite firm; it was not connected with the liver at all, nor with the diaphragm, but lodged quite securely in a depression which corresponded exactly to the size and the shape of the body, the capsule of the liver extending continuously over the depression.

The second of these bodies was flat on one side and convex on other, the flat surface being level with the liver surface surround-

ing the depression. This bean-like body measured 1 cm. in diameter and 5 cm. in thickness through the central or thickest part. From the center of the convex surface a thin, fibrous band passed to the margin of the depression in which the body was lodged, where it became connected with the capsule of the liver. The depression in this case also corresponded to the exact size and shape of the body.

Both these bodies were found in the cadavers of males, each one of which was over forty years of age, and in neither one were there any signs of either recent or old peritonitic inflammation.

On cross section both the bodies showed the same structure ; they consisted of a firm, semi-cartilaginous capsule, enclosing a yellowish, granular material. Microscopically the outer part of the capsule consisted of an almost homogeneous structure, breaking



up, as it were, into fibrous tissue near the central and softer mass which was made up of fat cells and amorphous granular material.

Free bodies in the peritoneal cavity of a firm or solid consistency, may have been introduced from without, or they may originate in the abdomen itself. Among the latter variety of *corpora libera* in the peritoneum may be mentioned subserous fibro-myomata of the uterus as well as other pedunculated neoplasms attached to the female pelvic organs, whole ovaries, and Morgagni's hydatids on the fimbria of the Fallopian tubes, any of which may, by the accidental twisting of the pedicle and its subsequent rupture, become liberated. Biliary and intestinal calculi may escape from their respective canals and the products of conception, may, by passing through ruptures in the uterus or in the sacs of extra-uterine pregnancy and becoming variously changed, come to constitute a variety of free bodies in the abdominal cavity. There is also a free body described of rather soft consistence, varying shape, whitish in color, and lamellated in structure, which is thought

to consist of fibrinous exudate produced in some forms of peritonitis.¹

But the most frequent variety of loose bodies of intra-abdominal origin consists of *appendices epiploicæ* which have been liberated by the rupture of their pedicles. The *appendices epiploicæ* are small peritoneal pouches filled with fat, and situated along the colon and the upper part of the rectum.² The loose bodies formed by the liberation of these pouches of fat are oval or round, usually flattened, resembling a bean, and consist of a capsule of fibrous tissue enclosing a central mass of fat which may have undergone degeneration. The two bodies described in this communication are undoubtedly detached *appendices epiploicæ*, to which they correspond in structure, size and shape. The fact that they were found in men eliminates any consideration of their possible origin from the number of sources for such bodies that are presented by the pelvic organs of women. It is thought that the *appendices epiploicæ*, the hanging appendages of the large intestine, may sometimes by their weight gradually stretch their pedicles until they become so very thin that but slight force would be necessary for their twisting and the detachment of the *appendices*. By the gradual stretching of the pedicle its blood-vessels would become obliterated, and the consequent anæmia of the appendix would result in softening of the central mass of fat and perhaps calcareous infiltration, at the same time as the peritoneal capsule of the appendix would undergo a cartilaginoid thickening. Shaw³ describes an almond-shaped *corpus liberum* in the abdomen which was one-half inch long, and at one extremity presented a minute projection which was probably the remains of the pedicle by means of which it was originally fixed. The external surface was smooth and shining; on section it consisted of a firm cartilaginous capsule filled with yellow material containing some gritty particles. Microscopically, the contents consisted of fatty granules and some irregular masses, requiring hydrochloric acid for their solution. This body was found in the pelvis of a female subject. On examining the colon one of the *appendices epiploicæ* was found much altered in structure, resembling, in fact, the body just described; it was

¹ Orth, Path. Anat., page 1014.

² Gray, Descriptive Anatomy.

³ Shaw, Transactions London Pathological Society, 1857.

attached by a very small pedicle, so slender indeed that a very small force would doubtless soon have detached it. There could therefore be no doubt but that the loose body described had resulted from a degeneration and separation of one of the *appendices epiploicæ*. Having become detached, the free appendix may be found in almost any part of the abdominal cavity. Thompson⁴ describes a round body, the size of a nut with a smooth surface, which was removed by Mr. Nesbitt from the omentum to which it was attached by a slender pedicle, forming part of the contents of a hernial sac. It was thought to be a loose *coli adiposa* which had become re-attached to the omentum.

Dr. Ogle⁵ exhibited a loose body about the size of a large almond, flattened on both sides, smooth, with a pearly cover, which he found in a depression in the upper surface of the right lobe of the liver, which was lined by the capsule of the liver; it was attached to the margin of the depression by a shreddy portion of fibrous tissue. Its interior consisted of granules, fatty matter and lime salts which was surrounded by pearly connective tissue. Dr. Ogle was of the opinion that it originated from some degenerated entozoa, such as echinococci, but the body corresponds in every respect to a detached *appendix epiploicæ* which had gotten up between the liver and the diaphragm, and then was pushed into the liver in the same manner as the two bodies mentioned in the beginning must have become lodged. That the free bodies produced by the detachment of these saccular processes of the peritoneal covering of the large intestine, enclosing fat, may acquire a little more than a purely anatomical interest has also been demonstrated. Moxon and Wilks⁶ make mention of a surgeon who found such a body in a hernial sac, and an altered appendix still attached was found to have caused the strangulation that made the operation necessary. Canton⁷ removed *post-mortem* a roundish body from the sac of an inguinal hernia of many years standing; the scrotum contained intestine, omentum, and a solid body which could not be made to pass the abdominal ring. This body bounded on the floor like rubber, it was oval, slightly flattened, and weighed one and

⁴ Thompson, Transactions London Pathological Society, 1860.

⁵ Ogle, Transactions London Path. Society, 1855.

⁶ Moxon and Wilks, Pathological Anatomy, London, 1889, page 394.

⁷ Canton, Westm. Medical Society Reports, 1850.

one-half ounces, the color was light yellowish brown, a lamellated caoutchouc-like capsule enclosed a nucleus, the size of a marble, that consisted of fat. The source of such a large body in a man might be difficult of explanation were it not known that actual lipomata of considerable size may develop from the *appendices epiploicæ*, and become detached in the same manner as an unchanged appendix by gradual stretching and atrophy of the pedicle with concomitant degeneration of the central fat mass, and cartilaginous thickening of the peritoneal covering. The possibility of these loose bodies becoming the actual cause of strangulation of intestinal loops in hernia sacs in rare instances may therefore be considered as established.

THORACIC ANEURISM. VARICOSE DILATATION OF SUBCUTANEOUS THORACIC AND ABDOMINAL VEINS. RUPTURE. DEATH.

Capt. L. J., 51 years of age, entered the Cook County Hospital, March 5, 1888, with, in brief, the following history :

Parents and one brother died of cholera. One sister died at thirty, of pulmonary tuberculosis ; one living and in good health.

Patient had small-pox at twenty-three. In 1872, had pleurisy, and again in 1873 and 1874. Has had gonorrhœa several times. Was treated in 1870 for syphilis, the treatment extending over a period of about a year.

He dated his present trouble three years back, when a temporary paralysis of the right arm and a pneumonia followed his sleeping in a draught. Six months after convalescence from this illness, he consulted a physician, because of pain in the chest. Unsuccessfully treated for neuralgia, he entered one of the city hospitals where his trouble was diagnosed as enlargement of the liver. He, later, entered the County Hospital for the first time. At some time during 1886 or 1887 (the exact date is lacking), fluid was withdrawn from the right chest. In 1887 he left the Hospital and remained out for more than a year.

His complaint, on re-admission, was of cough, with some expectoration, dyspnœa on exertion, pain referred chiefly to the right chest. These symptoms continued, with periods of amelioration and exacerbation, up to the time of his death. The pain was at

times so severe as to demand an opiate. Violent fits of coughing would cause loss of sleep. The sputa, at times, were blood-stained. Dyspnoea occasionally was extremely annoying. There was present generally a slight huskiness in his speech. The digestive and urinary systems furnished no symptoms, nor did the special senses. The temperature chart showed that, while ordinarily there was no febrile disturbance, an occasional irregular rise occurred, the thermometer registering at such times 99.5° to 102° . This irregular fever might last for a week, during which the patient complained only of malaise in addition to the previously existing symptoms. It would then disappear, to return again perhaps in three days, perhaps in three weeks. Repeated chemical and microscopical examinations of the urine gave negative results.

Physical Examination. Made at various times. All agreed as to main facts. From the record, made February 22, 1889, which was exceptionally thorough, the following abstract is made :

Inspection. Complexion clear ; skin dry ; *panniculus adiposus* absent ; respiration hurried. Subcutaneous abdominal and thoracic veins on either side of median line, and extending from clavicle to Poupart's ligament are markedly enlarged and tortuous. The veins of upper extremities and back, as also those on anterior thigh for three inches below Poupart's ligament, are plainer than usual. Over the right chest there is loss of motion (nearly complete), flatness, narrowing of intercostal spaces. Right nipple nearer the sternum than, and a little inferior to, the left; the right shoulder drops a little, and there is slight rotation inward of scapula. The lower half of dorsal portion of spinal column is curved laterally, the convexity being to left.

Palpation. Vocal fremitus less marked on right than on left side. Apex beat in fifth space midway between left sternal margin and nipple of same side. By pressing the finger into the intercostal spaces of the right infraclavicular and mammary regions, pulsations synchronous with apex beat can be felt. This is less marked over upper part of left infraclavicular region. There is no glandular enlargement in any region. Both radial pulses equal and synchronous.

Mensuration. Right chest slightly smaller than left. Deep inspiration causes no increase in right chest beyond two and one-

half millimetres, while left chest shows increase of two centimetres.

Auscultation. Heart-sounds heard over posterior surface and over right chest anteriorly. Exaggerated vesicular murmur over left chest. Over right clavicular regions roughened and prolonged expiratory sounds; over remaining anterior regions and laterally, complete absence of murmurs on ordinary inspiration; on deep inspiration, faint murmurs of a tubular quality seemed to be heard, both anteriorly and posteriorly; no marked increase in vocal resonance.

Percussion. Over right infraclavicular region, dullness; over remainder of right chest, flatness. Liver dullness extends two inches below costal arch when patient is standing.

An examination of the sputa March 12, 1889, showed no elastic fibres, no bacilli, though there were found staphylococci and very many streptococi.

Physical Examination. August 28, 1889, confirms that of February 22d. In addition it is now noted that inspection reveals a prominence of the right mammary region. About two inches above right nipple pulsation can be seen. The entire thorax moves in time with the heart beat. Pulsation is seen also in the enlarged abdominal veins. Palpation discovers in the right mamillary line between the third and fourth ribs a swelling, compressible, tender on pressure, with a pulsation expansive in character and synchronous with the apex beat. This pulsating swelling had been first noticed by the patient three weeks before. The apex beat is in the mamillary line behind the left sixth rib. Percussion and auscultation showed slight resonance and faint respiratory sounds over right apex, extending posteriorly as low as to the middle of the vertebral border of the scapula. Faint sounds could also be detected over an area one and one-half inches broad, extending along the right border of the spinal column. No bruit was detectable over the pulsating swelling just above the right nipple. Pulse slightly intermittent.

On October 21st, while the patient sat quietly smoking, he complained of sudden pain in the chest, and began to bleed freely from the mouth and nose. He grew rapidly weaker and died in about five minutes.

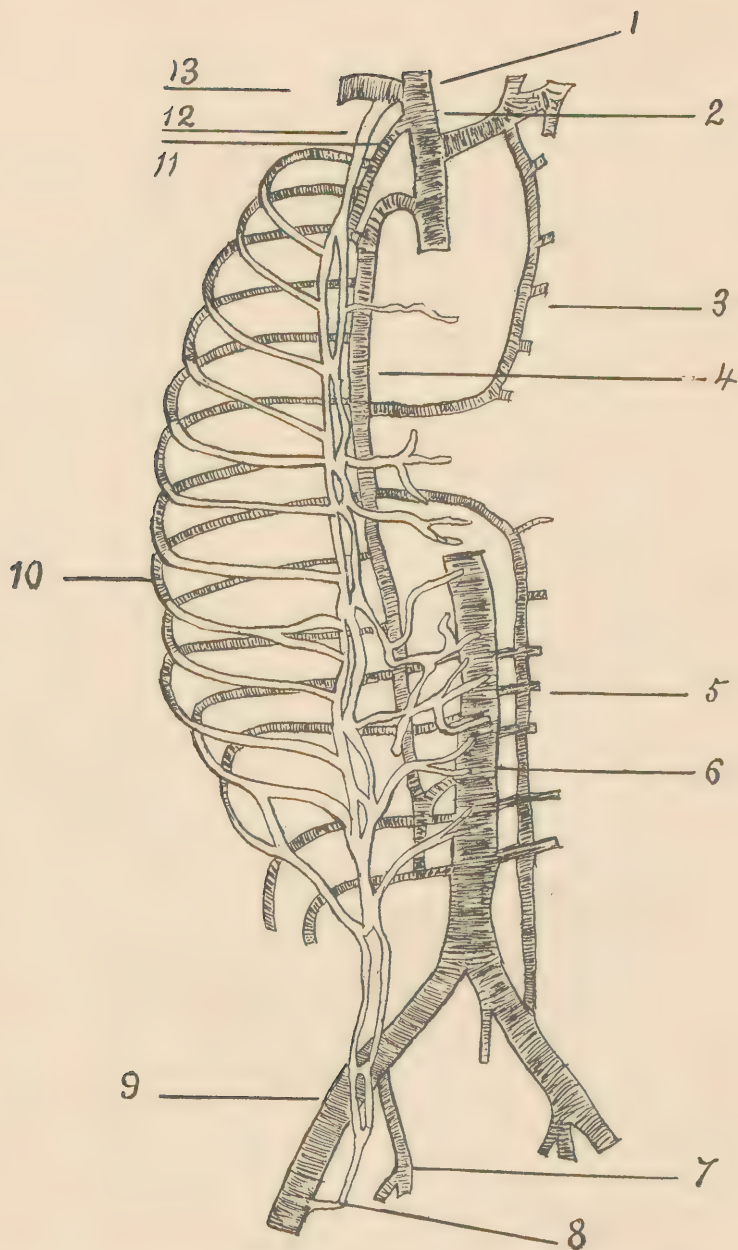
No systematic plan of treatment was pursued in this case beyond the administration of tonic and antisyphilitic medicines, opium and cough mixtures being given as required. In the beginning of the illness, that is, subsequent to the tapping of the right thoracic cavity, great uncertainty as well as multiplicity of diagnosis prevailed, until the signs of aneurism gradually became clearer and more distinct, though Dr. Fenger diagnosed aortic aneurism very soon after his admission to the Hospital the first time.

The autopsy, about 12 hours *post-mortem*, showed the body to have wasted away a great deal, as the skin could be pinched up into large folds; rigor mortis was quite well marked. The subcutaneous veins over the anterior part of the body, from the root of the neck downward to just below Poupart's ligaments, were conspicuously dilated and thrown into saccular convolutions, the bends of which felt knotty under the finger; there was no special dilatation of the veins around the umbilicus. This dilatation of the subcutaneous veins extended down the arms, gradually fading away as the elbows were approached, and it was also noticeable over the upper part of the back. The right half of the thorax seemed retracted and smaller than the left half. The peritoneal cavity was empty. On removing the sternum, the substernal areolar tissue, usually quite loose, was found to have given way to quite firm fibrous tissue, firmly binding the sternum as well as the costal cartilages to the tissues beneath them, and it was noticed that the internal mammary veins were not of any larger size than usual, at least not apparently so.

The left pleural cavity was empty and the pleura free from adhesions. It was found almost impossible to free the contents of the right pleural cavity from the thoracic wall. During the dissection a collection of creamy, viscid fluid, about three ounces in quantity, was found upon the diaphragm just beneath the anterior axillary line, enclosed in a cavity with very thick and firm semi-cartilaginous walls of fibrous tissue. Below the right nipple a rupture was made into an extensive sac which seemed to occupy the entire chest, and communicating with one of the large vessels, and in order to make an accurate anatomical examination the thoracic organs were then removed *en masse*.

The sac, just mentioned, was found to contain at the anterior

periphery, a considerable amount of whitish, granular detritus, which was prevented from falling into the central cavity by several laminae of quite firm, homogenous, reddish material; in several places these plates lining the interior of the sac were broken. Cleaning the interior of the sac of all its contents, it was found to communicate by means of a rather narrow neck with the right antero-lateral part of the transverse portion of the arch of the aorta, *i.e.*, the part of the aorta between the upper pericardial limit and the origin of the innominate artery. From this point of origin the sac had extended across the superior vena cava into the right thoracic cavity, which it had filled almost completely, its walls coalescing and becoming inseparably united with the upper segment of the right half of the pericardium, with the parietal pleura, lining the anterior, inferior, and lateral parts of the right chest cavity, and with the visceral pleura, covering the right lung, which lay flattened and condensed over the upper part of the sac, extending further downward posteriorly than anteriorly. The internal surface of the wall of this large pouch was mottled light grey and yellowish in color; it was rough to the touch, and in places distinct, calcareous, stony scales were found. At the posterior part there were two circular depressed areas, as large as a silver quarter of a dollar, with smooth and rounded borders, the floor of which consisted of pulmonary parenchyma. In the center of these areas was seen the patent bronchial tubes. At the inferior antero-lateral portion the sac was intimately adherent to the thick and firm wall of the abscess cavity already mentioned. The pericardium contained about twelve ounces of clotted blood; It was universally smooth and shining, except in that part of the parietal layer which covers the ascending aorta; here it becomes one layer with the wall of the sac, and shows yellowish and calcareous areas, and also an irregular tear through which it communicates with the aneurismal cavity. The heart was as large as the owner's fist, and shows no changes except a slight thickening of the aortic semilunar valves. All the vessels entering or leaving the heart were patent except the descending vena cava, which was firmly obliterated from its entrance into the right auricle and upward for a distance of one and a half or two inches, where it had been compressed by the aneurism immediately beneath which it passes



ANASTOMOSIS BETWEEN SUPERFICIAL AND DEEP VEINS. (*Henle*)

1—Internal jugular vein. 2—Innominate vein. 3—L. upper azygos vein. 4—V. azygos major. 5—L. lower azygos vein. 6—Inferior vena cava. 7—Hypogastric vein. 8—Epigastric vein. 9—Iliac vein. 10—Intercostal vein. 11—Superior intercostal vein. 12—Internal mammary vein. 13—Subclavian vein.

and to which it is closely connected; its walls were firmly united and its lumen for the distance indicated entirely obliterated; there was no dilatation of the part immediately above the obliteration, but the innominate veins seem larger than usual.

The œsophagus, trachea, and large bronchial tubes showed no variations from the normal; the bronchial tubes of the substance of the right lung had, of course, shared in the general compression which had made the right lung largely atelectatic so that it could be artificially inflated to a very slight extent. The entire left lung seemed enlarged, and the alveoli appeared increased in size. The organs in abdominal cavity showed no special morbid changes. The cranium and its contents were not examined.

Diagnosis. Sacculated aneurism of commencement of arch of aorta; rupture into pericardium and into right lung; compression-atelectasis of the right lung; adhesive phlebitis of superior vena cava; varicose dilatation of the subcutaneous abdominal and thoracic veins; empyema of right pleural cavity; chronic anterior mediastinitis.

Remarks. In addition to the clinical and anatomical facts briefly detailed, nearly all of which correspond to those of the history of thoracic aneurism in general, both in respect to the anatomical changes as well as to the apparent etiology, the symptomatology, the progress and the termination of the disease, with the exception of the complicating empyema. This case shows the effect of total obliteration of the superior vena cava during the greater part of its course. Anatomy tells us that the superior vena cava receives the blood which is conveyed to the heart from the whole upper half of the body. In this man the blood from the upper half of the body was compelled to seek its way to the heart along other routes on account of the occlusion of the superior vena cava from the pressure of the aneurismal sac. From the accompanying scheme modified from Henle,¹ it will be seen at a glance that the only route to the heart, open for the blood under the circumstances, would be by way of the internal mammary veins into the epigastric, and thence into the external iliac, reaching the heart through the inferior vena cava. In addi-

¹ Handbuch der Systematischen Anatomie des Menschen, Band III., p. 321, Braunschweig, 1868.

tion to this anastomosis, the network of subcutaneous veins on the anterior surface of the trunk serves to still further enlarge the communications between the large veins of the upper and lower halves of the body, becoming in this instance very markedly enlarged and tortuous much more so than would have been the case if the chronic inflammation in the anterior mediastinum and the subsequent cicatricial contraction had not interfered with the collateral dilatation of the internal mammary veins. Clinically no œdema of the neck or face or upper extremities was ever observed in this case, as one would naturally expect, and which so frequently does occur on account of serous compression by mediastinal tumors;² this absence of œdema can be explained as due to the gradually advancing compression of the superior vena cava, as well as internal mammary veins, giving the subcutaneous network abundant time to dilate sufficiently to afford complete compensation before entire obliteration of the vena cava took place.

² Eichhorst, *Path. und Therap.*, Band 1, p. 644, Vienna, 1890.

